

What is claimed is:

1. A cooling method of a metal part by immersing the heated metal part in a cooling liquid, characterized in that by applying a repeatedly varying pressure to a vapor film which is formed when the cooling liquid vaporizes on a surface of the metal part, the vapor film is broken without the stirring of the cooling liquid.
2. The cooling method of a metal part according to claim 1, characterized in that a repeatedly varying pressure is applied to the vapor film by applying oscillations to the cooling liquid.
3. The cooling method of a metal part according to claim 1, characterized in that a repeatedly varying pressure is applied to the vapor film by changing a liquid-level pressure of the cooling liquid.
4. The cooling method of a metal part according to claim 1, characterized in that a repeatedly varying pressure is applied to the vapor film by combining applying oscillations to the cooling liquid and changing the liquid-level pressure of the cooling liquid.
5. The cooling method of a metal part according to claim 2 or 4, characterized in that oscillations applied to the cooling liquid are given by multiple oscillators.
6. The cooling method of a metal part according to any one of claims 2, 4 and 5, characterized in that at least either of the amplitude and frequency of the oscillations is adjusted according to the thickness of the vapor film.
7. The cooling method of a metal part according to any one of claims 2, 4 and 5, characterized in that at least either of the amplitude and frequency of the oscillations is adjusted according to the condition of the cooling liquid.

8. A cooling method of a metal part according to any one of claims 1 to 7, characterized in that the cooling liquid is stirred after the vapor film begins to be broken and bubbles formed by the breakage of the vapor film are caused to diffuse in the cooling liquid.
9. The cooling method of a metal part according to claim 8, characterized in that at least either of the intensity of the stirring and the direction of a flow generated by the stirring is adjusted according to the condition of the cooling liquid and the condition of the metal part in the cooling liquid.
10. A method of manufacturing a metal part, characterized in that the manufacturing method comprises a step of heating a metal part and a step of cooling the metal part after the heating thereof by immersing the metal part in a cooling liquid, and in that in the cooling step, by applying a repeatedly varying pressure to a vapor film which is formed when the cooling liquid vaporizes on a surface of the metal part, the vapor film is broken without the stirring of the cooling liquid.
11. A cooling apparatus for a metal part, characterized in that the cooling apparatus comprises means for cooling a metal part after the heating thereof by immersing the metal part in a cooling liquid, and in that the cooling apparatus applies a repeatedly varying pressure to a vapor film which is formed when the cooling liquid vaporizes on a surface of the metal part, and breaks the vapor film without the stirring of the cooling liquid.